

REMARKS

The Office Action dated June 19, 2006, has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 45 and 46 have been amended to particularly point out and distinctly claim the invention. No new matter has been added, and no new issues are raised which require further consideration and/or search. Claims 1-3 have been cancelled. Claims 4-44 and 50-51 have been allowed. Claims 45-49 are submitted for consideration.

Claims 45, 47 and 49 were rejected under 35 U.S.C 103(a) as being unpatentable over U.S. Patent No. 5,815,246 to Sperling in view of U.S. Patent No. 5,194,893 to Nishi and U.S. Patent No. 4,835,078 to Harvey. According to the Office Action, Sperling teaches all of the elements of claims 45, 47 and 49 except for the velocity control and that the reference system is used for velocity control. Hence, the Office Action combined the teachings of Sperling, Nishi and Harvey to yield all of the elements of claims 45, 47 and 49. The rejection of claims 45, 47 and 49 is traversed as being based on referenced that neither teach nor suggest the novel combination of features clearly recited in independent claim 45.

Claim 45, upon which claims 47-49 depend, recites a semiconductor manufacturing apparatus including a mover device and a processing unit that performs processing on a processing object attached to a processing base of the mover device. The

mover device includes a fixed base, a movable base that is movable in a linear direction with respect to the fixed base, the processing base that is movable in a linear direction with respect to the movable base, the linear direction being in parallel with the linear moving direction of the movable base, a moving force generating unit that is provided between the processing base and the movable base, and forms a main moving unit in cooperation with the processing base and the movable base, and a velocity controlling unit that controls the moving velocity of the processing base with respect to the fixed base. The mover device also includes a P-F measuring unit that is provided between the processing base and the fixed base, and an M-F measuring unit that is provided between the movable base and the fixed base, the movable base forming an inertial force processing unit, and the moving force generating unit being controlled so as to control the moving velocity of the processing base with respect to the fixed base, using signals generated from the P-F measuring unit and the M-F measuring unit. The moving force generating unit is designed to generate a moving force to move the processing base with respect to the movable base, and, as a result, to move the processing base with respect to the fixed base. The movable base on the fixed base is moved in the opposite direction to the moving direction of the processing base by virtue of a reaction force caused by the moving force generated from the moving force generating unit to move the processing base.

As outlined below, Applicant submits that the cited references of Sperling, Nishi and/or Harvey do not teach or suggest the elements of claims 45, 47 and 49.

Sperling teaches a lithographic devices with a frame that includes a carrier which supports a support body. The support body is displaceably guided parallel to the X-direction and parallel to the Y-direction along the upper surface of the carrier. The carrier forms a base of the positioning device while the support body forms a balancing unit of the positioning device. A substrate holder forms a displaceable unit of the positioning device by means of two X-actuators and Y-actuator. The support body forms a common balancing unit for the two X actuators and the Y-actuator. The support body is guided over the upper surface of the carrier by means of a static gas bearing so that the common balancing unit is displaceable along the upper surface parallel to the X-direction under the influence of reaction forces of the X-actuator and displaceable along the upper surface parallel to the Y-direction under the influence of reaction forces of the Y-actuator. The support body is rotatable over the upper surface about an axis of rotation directed parallel to the Z direction, so that also a reaction moment can be compensated for which arises when the two X-actuators are activated in mutually opposed directions for obtaining a rotation of the substrate holder about an axis of rotation which is parallel to the Z-direction. Col. 8, line 66-Col. 9, line 20 and Col. 10, lines 4-31.

Nishi discloses that a projection exposure apparatus carries out scan exposure with illumination flux of slits by moving a mask and a substrate in a direction of one-dimension at synchronized speeds with each other. See at least the Abstract.

Harvey discloses that photomasks are aligned on opposite sides of a wafer by directing light beams through zone plates in one photomask and through aligned

transparent slits. See at least the Abstract. Claim 5 of Harvey recites that the step of moving a second mask relative to a first mask comprises the step of fixing the second mask with respect to a reference structure and moving the first mask relative to the reference structure.

Applicant submits that the combination of Sperling, Nishi and Harvey simply does not teach or suggest each element of claims 45, 47 and 49. Claims 45, in part, recites that a P-F measuring unit that is provided between the processing base and the fixed base, and an M-F measuring unit that is provided between the movable base and the fixed base, the movable base forming an inertial force processing unit, and the moving force generating unit being controlled so as to control the moving velocity of the processing base with respect to the fixed base, using signals generated from the P-F measuring unit and the M-F measuring unit. As acknowledged in the Office Action dated September 29, 2005, a mover device where the moving velocity of the processing base uses signals generated from the P-F measuring unit and the M-F measuring unit, as recited in claim 45, is a novel feature. Therefore, Applicants respectfully assert that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Sperling, Nishi nor Harvey, whether taken singly or combined teaches or suggests each feature of claim 45 and hence dependent claims 47 and 49, thereon.

Claim 46 was rejected under 35 U.S.C 103(a) as being unpatentable over Sperling in view of Nishi and Harvey, as applied to claim 45, and further in view of U.S. Patent 6,304,630 to Bisschops. According to the Office Action, Sperling, Nishi and Harvey

teach all of the elements of claim 46 except for the vacuum processing. Hence, the Office Action combined the teachings of Sperling, Nishi and Harvey with Bisschops to yield all of the elements of claim 46. The rejection of claim 46 is traversed as being based on referenced that neither teach nor suggest the novel combination of features clearly recited in independent claim 46.

Claim 46 recites a semiconductor manufacturing apparatus of a vacuum processing type including a mover device and a processing unit that performs processing on a processing object attached to a processing base of the mover device in a vacuum. The mover device includes a fixed base, a movable base that is movable in a linear direction with respect to the fixed base, the processing base that is movable in a linear direction with respect to the movable base, the linear direction being in parallel with the linear moving direction of the movable base, a moving force generating unit that is provided between the processing base and the movable base, and forms a main moving unit in cooperation with the processing base and the movable base, and a velocity controlling unit that controls the moving velocity of the processing base with respect to the fixed base. The mover device also includes a P-F measuring unit that is provided between the processing base and the fixed base, and an M-F measuring unit that is provided between the movable base and the fixed base, the movable base forming an inertial force processing unit, and the moving force generating unit being controlled so as to control the moving velocity of the processing base with respect to the fixed base, using signals generated from the P-F measuring unit and the M-F measuring unit. The moving

force generating unit being designed to generate a moving force to move the processing base with respect to the movable base, and, as a result, to move the processing base with respect to the fixed base. The movable base on the fixed base being moved in the opposite direction to the moving direction of the processing base by virtue of a reaction force caused by the moving force generated from the moving force generating unit to move the processing base.

Sperling, Nishi and Harvey have been discussed above. Bisschops discloses a method including generating a flow of liquid droplets, injecting the flow into a source space connected to a vacuum pump, and successively irradiating individual droplets with an intense, pulsed, laser beam focused on a droplet. See at least the Abstract of Bisschops.

Applicant submits that the combination of Bisschops, Sperling, Nishi and Harvey does not teach all of the elements recited in claim 46. Similar to claim 45, claim 46, in part, recites a P-F measuring unit that is provided between the processing base and the fixed base, and an M-F measuring unit that is provided between the movable base and the fixed base, the movable base forming an inertial force processing unit, and the moving force generating unit being controlled so as to control the moving velocity of the processing base with respect to the fixed base, using signals generated from the P-F measuring unit and the M-F measuring. As mentioned above with respect to claim 45, the Office Action dated September 29, 2005 acknowledged that a mover device where the moving velocity of the processing base uses signals generated from the P-F measuring

unit and the M-F measuring unit, as recited in claim 46, is a novel feature. Therefore, Applicants respectfully assert that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Sperling, Bisschops, Nishi nor Harvey, whether taken singly or combined, teaches or suggests each feature of claim 46.

Claim 48 was rejected under 35 U.S.C 103(a) as being unpatentable over Sperling in view of Nishi and Harvey, as applied to claim 45, and further in view of U.S. Patent 6,081,578 to Braat. According to the Office Action, Sperling, Nishi and Harvey teach all of the elements of claim 48 except for a tilting means. Hence, the Office Action combined the teachings of Sperling, Nishi and Harvey with Braat to yield all of the elements of claim 48. The rejection of claim 48 is traversed as being based on referenced that neither teach nor suggest the novel combination of features clearly recited in independent claim 45, upon which claim 48 depends.

Claim 45, Sperling, Nishi and Harvey have been discussed above. Braat discloses a projection system for projecting a mask pattern on a substrate by means of EUV radiation. The projection system consecutively includes a first concave mirror, a convex mirror, and a second concave mirror. See at least the Abstract of Braat.

Braat does not cure the deficiencies of Sperling, Nishi and Harvey with respect to claim 45, upon which claim 48 depends. Specifically, Braat does not teach or suggest a P-F measuring unit that is provided between the processing base and the fixed base, and an M-F measuring unit that is provided between the movable base and the fixed base, the movable base forming an inertial force processing unit, and the moving force generating

unit being controlled so as to control the moving velocity of the processing base with respect to the fixed base, using signals generated from the P-F measuring unit and the M-F measuring unit, as recited in claim 45. Therefore, Applicants respectfully assert that the rejection under 35 U.S.C. §103(a) should be withdrawn because neither Sperling, Braat, Nishi nor Harvey, whether taken singly or combined teaches or suggests each feature of claim 45 and hence dependent claim 48 thereon.

As noted previously, claims 45-49 now recite subject matter which was indicated to be allowable and claims 45-49 recite subject matter that is neither disclosed nor suggested in the prior art reference cited in the Office Action. It is therefore respectfully requested that all of claims 4-51 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned attorney at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "Arlene P. Neal", is written over a horizontal line.

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